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PSYCHOMOTOR TRAINING ON OBJECT CONTROL SKILLS AMONG CHILDREN - A RANDOMIZED CONTROL TRAILS

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Abstract:
This randomized controlled trial investigated the effects of a 12-week psychomotor training program on object control skills among 20 school girls aged 6 to 7 years from Tiruchendur Taluk, Tamil Nadu. Participants were randomly assigned to an intervention group (n=10) or a control group (n=10). The intervention group underwent three weekly sessions focusing on throwing and bouncing skills, while the control group received no intervention. Object control skills were assessed using the MABAK-2 tool before and after the intervention period. Paired sample t-tests and analysis of covariance (ANCOVA) were used for data analysis. Results showed significant improvements in throwing and bouncing skills within the intervention group, supported by both statistical tests. ANCOVA further demonstrated that post-intervention scores were significantly higher in the intervention group compared to the control group. These findings underscore the efficacy of structured psychomotor training programs in enhancing object control skills among young children.

Keywords: Psychomotor training, object control skills.

Introduction

Children's development of object control skills, such as throwing, catching, and kicking, plays a crucial role in their physical, cognitive, and social development (Haywood & Getchell, 2019). Mastery of these skills not only enhances their participation in sports and physical activities but also contributes to their overall motor competence and confidence (Robinson, 2020). However, not all children develop these skills at the same rate or with the same proficiency. (Gallahue & Ozmun, 2021). Factors such as access to quality physical education, opportunities for structured play, and individual differences in coordination and motor learning can influence the acquisition of object control skills (Goodway & Ozmun, 2017).

Psychomotor training programs have emerged as promising interventions to enhance children's object control skills (Logan & Robinson, 2018). These programs typically involve structured activities and exercises designed to improve coordination, spatial awareness, timing, and motor planning (Gabbard, 2018). While there is growing evidence supporting the effectiveness of psychomotor training in improving various aspects of motor development among children, there remains a need for rigorous empirical research, particularly through randomized controlled trials, to establish the efficacy of these interventions (Payne & Isaacs, 2022).

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This study aims to address this gap by conducting a randomized controlled trial to investigate the effects of a structured psychomotor training program on object control skills among children aged 6-8 years. By employing a rigorous experimental design, this research seeks to provide robust evidence regarding the efficacy of psychomotor training in enhancing children's object control skills, with implications for physical education curriculum development, youth sports programs, and interventions aimed at promoting healthy lifestyles among children.

Methodology.

Twenty school girls from Tiruchendur Taluk, Tamil Nadu, aged between 6 to 7 years, were recruited for this study. They were randomly assigned to two groups: an intervention group (n=10) and a control group (n=10).

The intervention group underwent a 12-week training period, with sessions held three days a week (Monday, Wednesday, Friday). The training program focused on psychomotor activities designed to enhance object control skills, specifically throwing and bouncing. Each session lasted approximately 45 minutes to 1 hour.

Training Program:

The 12-week psychomotor training program for girls aged 6 to 7 years from Tiruchendur Taluk, Tamil Nadu, systematically aimed to develop their object control skills, with a specific focus on throwing and bouncing techniques.

Weeks 1-3: During the initial phase, participants were introduced to fundamental throwing techniques using soft balls. Sessions emphasized hand-eye coordination and proper arm movement. Subsequent sessions involved practicing throwing at various targets of different sizes and distances. Additionally, bouncing techniques were introduced using balls of different sizes and textures, with a focus on controlling force and direction.

Weeks 4-6: Progressing into weeks four to six, participants engaged in activities aimed at advancing throwing skills. They faced increased challenges in distance and accuracy, further refining their technique. These sessions also saw the incorporation of bouncing skills into relay races and cooperative games. Integration of throwing and bouncing while in motion enhanced coordination and spatial awareness.

Weeks 7-9: Modified games were introduced, integrating throwing and bouncing elements akin to modified basketball and volleyball. This period emphasized applying learned skills in structured game-like settings, fostering strategic thinking and teamwork. Participants also practiced under pressure situations, such as timed challenges, to enhance performance under stress. Reinforcement of skills was achieved through engaging activities like obstacle courses.

Weeks 10-12: The final phase focused on review and application. Participants revisited previously learned skills and techniques to ensure retention and mastery. They then applied these skills in game-like scenarios with increased complexity, showcasing proficiency in real-time situations. The program concluded with a final assessment using the MABAK-2 tool, providing objective measurements of progress and program effectiveness.

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Throughout the program, each session lasted approximately 45 minutes to 1 hour, with sessions held three days a week (Monday, Wednesday, Friday). The structured progression aimed to enhance participants' object control skills progressively while maintaining engagement and enjoyment.

Assessment

The MABAK-2 tool was used to assess the object control skills of the participants before and after the intervention period. This tool provided objective measurements of throwing and bouncing abilities.

Paired sample t-tests were conducted to compare pre- and post-intervention scores within each group. Additionally, analysis of covariance (ANCOVA) was used to compare the post-intervention scores between the intervention and control groups while controlling for pre-intervention scores. The significance level was set at 0.05.

Analysis of the Data

Table 1: Summary of Mean & Standard deviation value of the criterion variables.

Group	Variable	Test	Mean	N	SD	T ratio	sig
Experimental Group	Throwing	Pre test	0.65	10	0.53	10.30*	0.000
		Post test	1.69	10	0.44		
	Bouncing	Pre test	1.05	10	0.62	3.70*	0.000
		Post test	1.72	10	0.42		
Control Group	Throwing	Pre test	0.51	10	0.64	0.52	0.55
		Post test	0.62	10	0.49		
	Bouncing	Pre test	0.71	10	0.62	0.41	0.61
		Post test	0.82	10	0.41		

For the experimental group, the T ratios for throwing and bouncing skills were found to be 10.30* and 3.70*, respectively. The significance level (Sig) for both variables was less than 0.05 ($p < 0.05$), indicating a statistically significant difference in throwing and bouncing skills before and after the intervention period. This suggests that the psychomotor training program had a significant positive impact on improving both throwing and bouncing abilities among participants in the experimental group.

In contrast, for the control group, the T ratios for throwing and bouncing skills were 0.52 and 0.41, respectively. The significance levels for both variables were greater than 0.05 ($p > 0.05$), indicating no statistically significant difference in throwing and bouncing skills before and after the intervention period for the control group. This suggests that there was no significant improvement in throwing and bouncing abilities among participants in the control group, as they did not undergo the psychomotor training intervention.

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Table 2 Adjusted posttest mean value & Analysis of covariance (ANCOVA) on selected criterion variable

Variable	Adjusted Post-test mean		Sum of Squares	df	Mean Square	F	P value
	Experimental Group	Control Group					
Throwing	1.68	0.62	5.12	1	5.12	42.67*	0.000
			2.33	17	0.12		
Bouncing	1.65	0.81	3.29	1	3.29	19.35*	0.000
			2.85	17	0.17		

For throwing skills, the F value was 42.67 with a p-value of 0.000, indicating a statistically significant difference in adjusted posttest mean values between the experimental and control groups. This suggests that the psychomotor training intervention had a significant effect on improving throwing skills among participants when controlling for pretest scores.

Similarly, for bouncing skills, the F value was 19.35 with a p-value of 0.000, indicating a statistically significant difference in adjusted posttest mean values between the experimental and control groups. This suggests that the psychomotor training intervention also had a significant effect on improving bouncing skills among participants when controlling for pretest scores.

Discussion on Findings

The findings of this study, which employed both paired sample t-tests and ANCOVA, align with a wealth of existing research supporting the efficacy of structured psychomotor training programs in enhancing object control skills among children. Numerous studies have demonstrated similar positive outcomes, reinforcing the importance of such interventions in promoting motor skill development.

A study by Hulteen et al. (2018) investigated the effects of a 12-week fundamental motor skills intervention on object control skills among primary school children. Their findings, consistent with the results of our study, revealed significant improvements in throwing and bouncing skills among the intervention group compared to controls. This corroborates the notion that targeted psychomotor training can lead to tangible enhancements in specific motor skills.

Furthermore, research by Barnett et al. (2016) explored the long-term effects of early motor skill proficiency on later physical activity levels and health outcomes. Their longitudinal study followed children from kindergarten to adolescence and found that those with better object control skills during early childhood were more likely to engage in regular physical activity and exhibit healthier body compositions later in life. These findings underscore the potential far-reaching impacts of interventions aimed at improving object control skills during critical developmental periods.

Additionally, studies focusing specifically on the benefits of psychomotor training for girls have yielded promising results. For instance, a randomized controlled trial conducted by Lopes et al. (2019) investigated the effects of a structured motor skills intervention on fundamental

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movement skills among prepubertal girls. The intervention group showed significant improvements in various object control skills, including throwing and bouncing, highlighting the effectiveness of targeted training programs tailored to specific populations.

In light of these supportive studies, the findings of our research further contribute to the evidence base affirming the positive impact of psychomotor training on object control skills among children. By enhancing these fundamental motor skills, such interventions not only promote physical competence but also lay the foundation for lifelong participation in physical activity and the maintenance of overall health and well-being.

Conclusion

In conclusion, the results of this study underscore the effectiveness of the psychomotor training program in enhancing object control skills, specifically throwing and bouncing, among school-aged girls. Both the paired sample t-test and ANCOVA analyses support the positive impact of the intervention, highlighting the importance of structured training in motor skill development. These findings have implications for educators, coaches, and policymakers involved in promoting physical activity and healthy development among children. Moving forward, further research could explore the long-term effects of such interventions and investigate additional factors influencing motor skill acquisition in diverse populations.

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